

REMARKS

All amendments have been made to remove multiple dependency while conserving the claimed subject matter. More specifically, the limitations of claim 53 have been incorporated into claim 66 and 68 and the limitations of claim 48 have been incorporated into claim 70. Further, new claims 71 and 72 are subsets of original claims 69 and 70, respectively. Thus, no new matter has been introduced.

Attached is a marked-up version of the changes being made by the current amendment.

Claims 1-72 are now pending. Applicant submits that all of the claims are now in condition for examination, which action is requested. Please apply any charges to Deposit Account No. 06-1050.

Respectfully submitted,

Date: _____

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Version with markings to show changes made

In the claims:

Claims 3-5, 7-8, 17-18, 27, 31-33, 39-40, 43, 45, 47, 51-52, 59-60, 62-63, and 65-70 have been amended as follows:

3. (Amended) The method according to claim 1 [or 2] wherein the fungal pathogen is *G. graminis* (take-all fungus).

4. (Amended) The method according to claim 1 [or 2] wherein the fungal pathogen is *Botrytis fabae*.

5. (Amended) The method according to [any one of claims 1 to 4] claim 1 wherein the sugar acid is selected from the group consisting of mannonic acid, gluconic acid, and galacturonic acid.

7. (Amended) The method according to [any one of claims 1 to 6] claim 1 wherein the sugar acid is administered in pure or partially-purified form.

8. (Amended) The method according to [any one of claims 1 to 6] claim 1 wherein the biocontrol agent is capable of producing an anti-fungal effective amount of the sugar acid when incubated in media containing an aldose substrate.

17. (Amended) The method according to [any one of claims 14 to 16] claim 14 wherein the sugar acid is administered in pure or partially-purified form.

18. (Amended) The method according to [any one of claims 14 to 16] claim 14 wherein the biocontrol agent is capable of producing an anti-fungal effective amount of the sugar acid when incubated in media containing an aldose substrate.

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27. (Amended) The biocontrol agent according to claim 25 [or 26] wherein the derivative has enhanced capacity compared to *Pseudomonas* strain AN5rif to colonize the rhizosphere of a plant.

31. (Amended) A phytoprotective composition for the treatment of a fungal infection of a plant comprising the biocontrol agent according to [any one of claims 24 to 27] claim 24 in combination with a phytopathologically-acceptable diluent or wetting agent.

32. (Amended) The phytoprotective composition according to [any one of claims 28 to 31] claim 28 wherein the wetting agent is a non-ionic detergent.

33. (Amended) The phytoprotective composition according to [any one of claims 28 to 32] claim 28, wherein the fungal infection is an infection by a fungal pathogen selected from the group consisting of *Alternaria* spp.; *A. mellae*; *A. oligosporus*; *B. granulatus*; *B. cinerea*; *Botrytis fabae*; *C. purpurea*; *C. ribicola*; *E. purpurea*; *F. annosus*; *F. oxysporum*; *G. graminis* var. *tritici*; *G. cingulata*; *G. juniperi-virginianae*; *M. fructicola*; *P. alfalfae*; *P. infestans*; *P. sulphureus*; *Puccinia* spp.; *S. apiicola*; *Ustilago* spp.; *V. inaequalis*; and *V. dahliae*; and still more preferably, a fungal pathogen of monocotyledonous plants selected from the group consisting of *C. purpurea*; *G. graminis* var *tritici*; *Puccinia* spp.; and *Ustilago* spp..

39. (Amended) A composition for the treatment of a fungal infection in a human or other mammal comprising the biocontrol agent according to [any one of claims 24 to 26] claim 24 in combination with one or more pharmaceutically-acceptable carriers or diluents.

40. (Amended) The composition according to [any one of claims 36 to 39] claim 36 for the treatment of a condition selected from the group consisting of tinea pedis (athlete's foot), tinea cruris, tinea corporis (ringworm), candidiasis, onychia, paronychia, external genital candidiasis, candidal balanitis, pityriasis versicolor and jockey-strap itch.

43. (Amended) The method according to claim 41 [or 42] wherein the aldose is selected from the group consisting of glucose, mannose and galactose.

45. (Amended) The method according to [any one of claims 41 to 44] claim 41 wherein the culture conditions comprise growth on potato dextrose media or pontiac medium containing aldose substrate.

47. (Amended) The method according to [any one of claims 41 to 44] claim 41 wherein the culture conditions comprise growth on potato dextrose media or pontiac medium followed by incubation in a concentrated solution of aldose substrate.

51. (Amended) The isolated nucleic acid molecule according to [any one of claims 48 to 50] claim 48 comprising the nucleotide sequence of SEQ ID NO: 1.

52. (Amended) The isolated nucleic acid molecule according to [any one of claims 48 to 51] claim 48 comprising the nucleotide sequence of the *Pseudomonas* genome contained in the cosmid clone pMN M53 (AGAL Accession No. NM 00/09622).

59. (Amended) The isolated nucleic acid molecule according to [any one of claims 53 to 58] claim 53 comprising the nucleotide sequence of the *Pseudomonas* genome contained in the cosmid clone pMN-L2 (AGAL Accession No. NM 00/09621).

60. (Amended) A method of producing a sugar acid comprising expressing the isolated nucleic acid molecule according to [any one of claims 48 to 52] claim 48 in a cell, tissue or organism and culturing said cell, tissue or organism in the presence of an aldose substrate for a time and under conditions sufficient to produce a sugar acid.

62. (Amended) The method according to claim 60 [or 61] further comprising extracting or purifying the sugar acid produced.

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63. (Amended) The method according to [any one of claims 60 to 62] claim 60 wherein the cell is a bacterial cell.

65. (Amended) The method according to [any one of claims 60 to 62] claim 60 wherein the cell, tissue or organ is a plant cell, tissue, or organ.

66. (Amended) The method according to [any one of claims 60 to 65] claim 60 further comprising expressing [the] a nucleic acid molecule [according to any one of claims 53 to 59] for a time and under conditions sufficient to produce PQQ in the cell, tissue or organ; wherein the nucleic acid molecule comprises a nucleotide sequence encoding one or more enzymes involved in the biosynthesis of PQQ, wherein said nucleotide sequence is selected from the group consisting of:

- (i) a nucleotide sequence having at least about 50 contiguous nucleotides of any one of SEQ ID NOs: 2 to 6 or a complementary sequence thereto;
- (ii) a nucleotide sequence having at least about 50 contiguous nucleotides of the *Pseudomonas* gene sequence contained in the cosmid clone pMN-L2 (AGAL Accession No. NM 00/09621); and
- (iii) a nucleotide sequence that is degenerate to any one of SEQ ID NOs: 2 to 6 or the *Pseudomonas* gene sequence contained in the cosmid clone pMN-L2 (AGAL Accession No. NM 00/09621).

67. (Amended) A method of enhancing the tolerance of a plant to infection by a fungal pathogen comprising expressing therein the isolated nucleic acid molecule according to [any one of claims 48 to 52] claim 48, and optionally a second isolated nucleic acid molecule encoding one or more PQQ-biosynthesis enzymes, for a time and under conditions sufficient for a sugar acid to be produced by said plant, or by a cell, tissue or organ of said plant.

68. (Amended) The method according to claim 67 wherein the second isolated nucleic acid molecule [is the nucleic acid molecule according to any one of claims 53 to 59] comprises a nucleotide sequence encoding one or more enzymes involved in the biosynthesis of

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PQQ, wherein said nucleotide sequence is selected from the group consisting of:

- (i) a nucleotide sequence having at least about 50 contiguous nucleotides of any one of SEQ ID NOs: 2 to 6 or a complementary sequence thereto;
- (ii) a nucleotide sequence having at least about 50 contiguous nucleotides of the *Pseudomonas* gene sequence contained in the cosmid clone pMN-L2 (AGAL Accession No. NM 00/09621); and
- (iii) a nucleotide sequence that is degenerate to any one of SEQ ID NOs: 2 to 6 or the *Pseudomonas* gene sequence contained in the cosmid clone pMN-L2 (AGAL Accession No. NM 00/09621)..

69. (Amended) A transformed plant comprising the isolated nucleic acid molecule [according to any one of claims 48 to 59] claim 48.

70. (Amended) A progeny plant, cell, tissue or organ of the plant according to claim 69, wherein said progeny, cell, tissue or organ comprises the isolated nucleic acid molecule [according to any one of claims 48 to 59] ; wherein the nucleic acid molecule comprises a nucleotide sequence which encodes one or more enzymes involved in the biosynthesis of a sugar acid, wherein said nucleotide sequence is selected from the group consisting of:

- (i) a nucleotide sequence which is at least about 50% identical to at least about 30 contiguous nucleotides of SEQ ID NO: 1 or a complementary sequence thereto;
- (ii) a nucleotide sequence which is at least about 50% identical to at least about 30 contiguous nucleotides of the *Pseudomonas* gene sequence contained in the cosmid clone pMN M53 (AGAL Accession No. NM 00/09622);
- (iii) a nucleotide sequence which is capable of hybridising under at least low stringency conditions to at least about 30 contiguous nucleotides of SEQ ID NO: 1 or a complementary sequence thereto;
- (vi) a nucleotide sequence which is capable of hybridising under at least low stringency conditions to at least about 30 contiguous nucleotides of the *Pseudomonas* gene sequence contained in the cosmid clone pMN M53 (AGAL Accession No. NM 00/09622); and

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(vii) a nucleotide sequence which is degenerate to SEQ ID NO: 1 or the *Pseudomonas* gene sequence contained in the cosmid clone pMN M53 (AGAL Accession No. NM0009622).

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